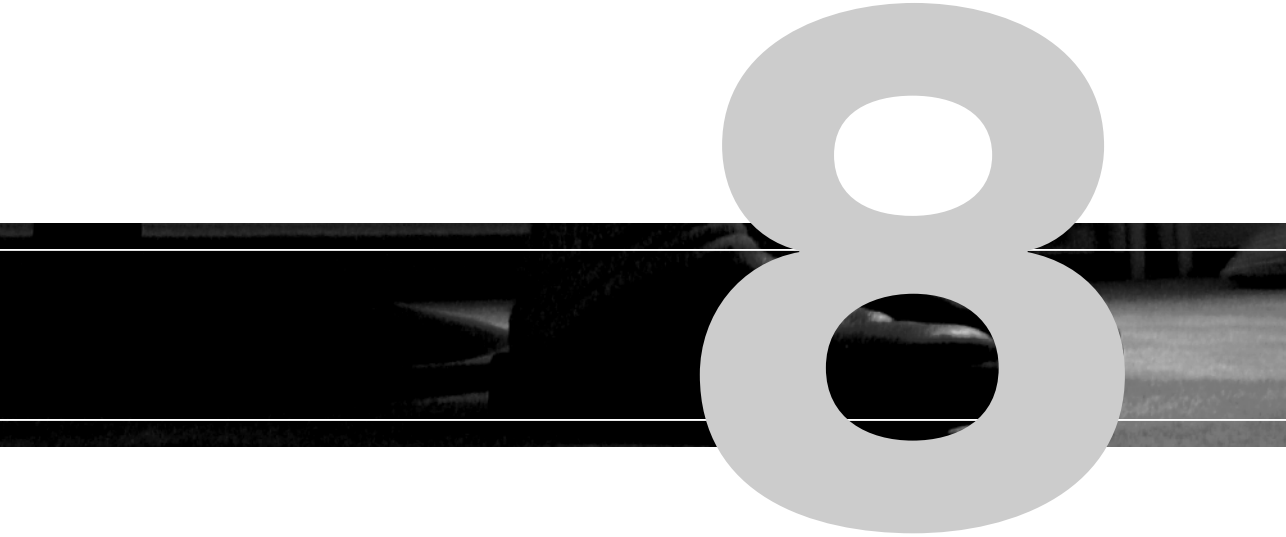
Posttraumatic stress disorder in late life

van Zelst-Kwakkel, W.H.

2007

document version
Publisher's PDF, also known as Version of record



8

Summary & General Discussion

Preface

In this chapter the main findings and conclusions of the studies presented in this thesis are summarized and discussed. The thesis focuses on Posttraumatic Stress Disorder and subthreshold PTSD in older adults, of which, at the start of this thesis, a dearth of information existed regarding its assessment in the population, prevalence, risk factors, consequences, comorbidity, course, and incidence. Here for the first time, a description has been given of the group of older individuals that suffers from PTSD in a community-based population as well as an account of the traumatic events that caused their PTSD. It also presents, for the first time in the extant research on this subject, epidemiological data on prevalence, course, incidence and consequences of PTSD in older adults. It contributes to the literature in that it highlights the role of subthreshold PTSD in this age group as clinically relevant. Next, new information on the origin of comorbidity of PTSD in this age group has been presented. Finally, the validation of a PTSD screening instrument in a population-based sample of older persons was described, which was not done before in the literature.

The Longitudinal Aging Study Amsterdam (LASA)

All studies described in this thesis were based on data of the Longitudinal Aging Study Amsterdam (LASA). The major strengths of the design are 1) that it is a prospective study, 2) that it collects information on all components of functioning (e.g. physical, cognitive, emotional and social), 3) that it was set up as a population-based study and 4) that the measurement instruments used were selected for national and international comparability. This makes it possible to make connections between areas of functioning and also to follow them in time.

Findings from the LASA study may be generalized to the broader group of citizens of the Netherlands or to populations living in the same conditions. However, as is inevitable in a longitudinal study, attrition limits generalization of results. Therefore, the initial sample was weighted according to expected mortality at mid-term within each sex and age group, so that after five years equal numbers of men and women were expected to be alive in the ages 55-59, 60-64, 65-69, 70-74, 75-79, and 80-85 years. This design was expected to provide sufficient opportunity for multivariate research and for obtaining adequate sub-samples for special studies. In addition, it should leave a sufficient number of participants to be examined after a period of ten years. The information for the present thesis was gathered respectively six and nine years after the start.

The main questions of the study

In the next part a justification will be given for our first research questions on the prevalence and characterization of PTSD and subthreshold PTSD. At the time of planning for this thesis, the presence and phenomenology of PTSD in older adults was a neglected issue in the literature[1;2]. An important contribution to the literature came from research on veterans of World War II in the Netherlands[3;4]. However, as this research focused on war-related traumas, there was no clear picture of the size of the population that suffered from PTSD caused by other traumas or of the nature of their symptoms.

We were especially interested in the subthreshold cases who present with enough symptoms to delineate a disorder but do not fulfil the strict criteria of the DSM-IV. There were several reasons to focus on this group.
Firstly, it was known from the literature on depression that older persons in the population suffer more often from the subthreshold disorder ('minor depression') than from the full disorder (Major Depression)[5] and similar phenomena were seen in anxiety disorders[6]. Therefore, it was expected that in older persons with PTSD the same mechanism of 'dilution' of complaints may exist while remaining the grave consequences for wellbeing and functioning.
Secondly, the delineation of the disorder is a rather arbitrary process and it arises from decisions that are based on the findings available at a certain moment. Thresholds may change in time when new information is presented, as it often happens in known cases. For instance, in the DSM-III edition, PTSD was first described as "the existence of a recognizable stressor that would evoke significant symptoms of distress in almost everyone" together with one symptom of intrusion, one of limited reactivity and two other symptoms (hyper-arousal, guilt or avoidance)[7]. In the DSM-III-R version[8], the stressor had to be outside the range of normal human experience and the criteria were rearranged into intrusion, avoidance and hyper-arousal from which respectively 1, 3 and 2 criteria were needed for the diagnosis. Then, in the DSM-IV[9], the stressor had to implicate an actual threat of death or serious injury (A1-criterion) and the A2-criteria were added. These require the experience of intense fear, terror or helplessness. Apparently, in the progression of history the criteria have been made more difficult to reach and now critics plea for broadening the concept[10] and lowering the threshold[11]. In addition, information from both sides of the threshold is valuable in order to grasp the scope of the problem. Finally, for reasons of comparison with international studies on PTSD that have almost invariably loosened their criteria for PTSD, it was practical to also include subthreshold cases in our study.

Clarification of the 'risk factors' for PTSD and subthreshold PTSD was the next main question of the study because knowledge of risk factors can help clinicians to identify the disorder sooner and that would contribute relevant new information to the literature of old age psychiatry. The LASA study offered a very good opportunity for this investigation, because all sorts of information was collected from the participants, including information on recent and remote stressors (apart from the stressor that was identified as the traumatic event causing the PTSD!), physical and mental functioning, personality, education and income. All these factors are theoretically considered to be indispensable information because they are interrelated and should be considered in connection with each other for a proper weighting of their importance[12]. Finally, the identification of the same risk factors for PTSD and for subthreshold PTSD might illuminate the gradual transition between the two disorders and it justifies the recognition of subthreshold cases as an important group.

The third research question of this thesis concerns the consequences of PTSD and subthreshold PTSD in daily life functioning and health care services. As mentioned above, if PTSD in late life behaves analogously to depression or anxiety, the impact was expected to be serious for both the full as well as the subthreshold cases. Again, the broad collection of data in LASA permitted a precise weighing of the relative contributions of different factors to the negative outcome of respondents with PTSD. Consequently, this knowledge would have important consequences for the organization of the health care of older persons with PTSD.

The fourth research question came from the obvious wish to understand the relationship between three old age disorders: depression, PTSD and the other anxiety disorders the LASA study had reported on. It would make an important contribution to the literature in this area. What is more, no population-based study had ever described the magnitude of the co-occurrence in older persons. From outcome studies in old age it was known that PTSD can complicate the straightforward treatment of depression and anxiety[13] and an understanding of the relationship could contribute to better treatment. Through identification of qualitative or quantitative aspects that contribute to comorbidity, the interrelationship might be clarified.

The fifth research question concerned the longitudinal course and the incidence of cases. This had been an entirely unresolved question in the epidemiological literature on PTSD in older persons. The longitudinal design of the LASA-study offered the unique opportunity to clarify these questions. Although the low numbers in the study formed a drawback, the unique contribution of such a study would certainly give an estimate about the magnitude of the unresolved problem.

The final research question, namely the validation of the Self-Reporting Inventory for Posttraumatic Stress Disorder (SRIP) in an older community-based population, was actually the first question to be resolved, because no such screening instrument existed yet and the use of the SRIP enabled the above mentioned research. Finally, the occurrence of two shocking public events showed serious impact on the ongoing measurements of the SRIP and created the scientific interest to describe this until then unpublished phenomenon. With this, the last research question was born: to describe the impact of public events on the scores of the screening-instrument.

Summary of the main findings

Prevalence and risk factors of Posttraumatic Stress Disorder in older adults (Chapter 2)

No information exists on prevalence of PTSD in an older community-based population. Prevalence rates in younger age groups differ widely due to differences in trauma exposure, assessment and methodology. In one study, a six months prevalence as low as 0.44% was found[14]. In contrast, a life-time prevalence as high as 18.3% has also been described[15]. In the LASA study participants were researched with a PTSD screenings-instrument and in all screen-positives and a random selection of screen-negatives a Composite International Diagnostic Interview (CIDI) diagnosis was made. This two-phase design of data collection enabled determination of prevalence rates of the disorder and the subthreshold disorder in the research sample. These were then weighted back to the general population based on age- and gender. In the older population in the Netherlands, six month prevalence of PTSD and of subthreshold PTSD was 0.9% and 13.1%, respectively. The findings suggest that PTSD in old age increases slightly. The large predominance of subthreshold cases over diagnosed cases is a common phenomenon in older populations and is discussed. This may be due to the diversity of the several complaints that older persons can have in such a way that mostly not enough criteria for a particular disorder are met.

Risk factors were categorized and analyzed in several domains and the most parsimonious subset of factors together with recent distressing events and adverse events in childhood were analyzed in a final regression analysis. Both neuroticism and adverse events in childhood were most strongly associated with PTSD as well as with subthrehold PTSD and these yielded odds ratios of 13.4 and 12.1 respectively, and 5.5 and 3.7 respectively. Low self-efficacy was also significantly associated with subthrehold PTSD.

Well-being, physical functioning, and use of health services in the elderly with PTSD and subthreshold PTSD (Chapter 3)

In younger subjects, PTSD as well as the subthreshold disorder have been shown to be associated with impairments in physical, social and psychological functioning and with an increase in somatic health care service utilization[16;17]. In this study, we demonstrated that both these disorders also have unfavourable effects in older subjects. Impaired daily life functioning -- meaning more days spent in bed as well as days of limited activities -- was highest in the PTSD group even when corrected for the number of chronic diseases, which were also higher in this group. This was also significant for the subthreshold group. Both subjects with PTSD and subthresold PTSD perceived their health as worse than controls. Especially subjects with subthreshold PTSD reported more loneliness. Both were less satisfied with their lives than controls. They also reported more unmet needs than did controls.

Another important finding of the study was that subjects with (subthreshold) PTSD visit somatic specialists more often than controls, but rarely seek help from a psychiatrist for their PTSD. The most frequently used medications were benzodiazepines, but very few used SSRI's.

Comorbidity in older adults with Posttraumatic Stress Disorder (Chapter 4)

Extant literature on adults suggested that PTSD frequently occurred with comorbid psychiatric disorders, but whether this applied also to older subjects was not known. Moreover, it was unknown if this comorbidity was associated with specific risk factors or if it was simply a correlate of the severity of PTSD. The consequence of the latter may be that treatment should not be focused on the separate comorbid disorders, but on PTSD itself at first and that comorbidity can be expected to disappear with improvement of PTSD.

It was demonstrated that comorbidity in PTSD was almost 40% and that it increased in a gradient line of severity of PTSD, with no PTSD having less comorbidity, subthreshold PTSD having more comorbidity, and full blown PTSD having the most comorbidity. Severity of PTSD appeared to be the most important risk factor for comorbidity and no other risk factors were found. It was concluded that in this group of older persons, comorbidity is the exponent of severity rather than a separate condition that distinguishes itself among the group of PTSD patients. This study has produced no arguments for treating specific psychiatric comorbid disorders separately in PTSD patients.

The longitudinal course and new onset of PTSD in an older population: a community-based prospective study (Chapter 5)

To our knowledge, to date there are no epidemiologic studies that investigate the longitudinal course of PTSD in older subjects by applying two assessments on the same population in order to follow up cases of PTSD and compute its incidence rate. From a cohort of older former prisoners of war, an increase in subjects with PTSD was reported. Another epidemiologic study focused on reassessed adolescents and young adults aged 14-24. It revealed a high persistence of the disorder after three years [18].

We followed the course of LASA respondents with twelve-month-PTSD between the third and fourth cycle, which is a period of three years, and investigated the incidence of new cases. We found a 10% new onset of PTSD, especially subthreshold PTSD, in three years. New onset of CIDI diagnoses in our study population was 0.4%. The transition of subthreshold PTSD to PTSD occurred in 4%. All new CIDI-cases appeared to be caused by old traumas. Moreover, PTSD in older subjects appeared to be a highly persistent disorder, remaining in 2/3 of the respondents with (subthreshold) PTSD. Compared to the younger age group, the rate of persistence and the incidence seemed higher in old age. PTSD often fluctuated between the full disorder and the subthreshold disorder, but total numbers with (subthreshold) PTSD increased during follow-up. The possible reasons for the relapses are not known yet and several possibilities are discussed.

The high number of former PTSD respondents who were unable to respond to the second assessment in this study due to incomplete interviews reflect the frailty of subjects with PTSD. However, attrition due to refusal, ineligibility, or loss of contact was very low, which is a strong point in PTSD research. These findings may inform future health care management because they demonstrate that more treatment facilities may be needed for older subjects with PTSD than thought before, as well as the need for programs that monitor recent relapses in older persons and focus on recovery and prevention of new relapses.

Criterion validity of the self-rating inventory for PTSD (SRIP) in the community of older adults (Chapter 6)

No screening instrument for PTSD appeared to be validated for the older community based population. The Self-rating Inventory of PTSD (SRIP), which was based on the DSM-III-R and validated against the Clinician Administered PTSD Schedule (CAPS) in younger psychiatric out-patients and older (male) trauma victims, was administered to the LASA cohort and compared to CIDI diagnoses that have been considered to be the gold standard.

The SRIP demonstrated a low sensitivity of 22.6%. This was to be expected because the prevalence in the general population is lower than in psychiatric outpatients or veterans. Using Receiver Operator Characteristic (ROC) curve analysis, a better cut-off of the SRIP was found with satisfying psychometric properties for its use with older subjects in the general population. Namely, at a threshold of 39, it had a sensitivity of 74.2% and specificity of 81.4%.

The effect of two recent events on the symptoms of posttraumatic stress disorder in the older population of the Netherlands (Chapter 7)

During the data collection of the fourth LASA cycle, two horrifying public events shocked the people in the Netherlands. The impact of these events were demonstrated by higher scores on the SRIP. For the first event, the September-11 attack in the US in 2001, analysis of variance with linear contrast demonstrated that the initial elevations of the mean week (SRIP) values decreased with time. This was reported in a letter to the editor when about half of the data had been collected. The second event, the murder of the national politician Pim Fortuyn, on May 6, 2002, had similar effects and after both events differences in mean week scores of the SRIP were demonstrated.

Findings were discussed in the light of the literature generated in response to the first event. The contrast between subjects being a victim and subjects (only) having a (slight) shift in symptom-recording was highlighted. Public events having a profound impact on the outcome of screening scales is a newly documented phenomenon in the literature.

Methodological and conceptual considerations

Time perspectives for defining cases

For the different research questions, different periods of time were chosen for assessing cases. In order to minimize recall bias in the prevalence study, PTSD cases (chapter 2) were defined as respondents who had fulfilled CIDI criteria in the previous six months. However, this requirement might have been too conservative, because PTSD in older persons appears to be long lasting (see chapter 5). Using a one year prevalence to define cases might have been defensible (and more convenient for statistical power). The use of life-time prevalence rates may be preferred in the very young where only moderate differences between levels of one year and lifetime prevalence of PTSD are reported[19]. However, using lifetime prevalence is inappropriate in an older population when one is interested in the current burden of the disorder. The same arguments applied to the research of

consequences of PTSD in which we were interested in the effect of the subjects' suffering from the present burden of PTSD on daily life functioning.
For the purpose of validation of the screening instrument, only respondents with the complete disorder in the previous six months were included as the 'gold standard' of PTSD (Chapter 6). In contrast, when focusing on the comorbidity of PTSD (Chapter 4), it seemed appropriate to include twelve month prevalence cases, because PTSD as well as depression and anxiety are long lasting and related disorders and their symptoms can easily be spread out over a year.
Studying the longitudinal course of PTSD over a period of three years (chapter 5) demanded also a twelve month time frame for the CIDI-diagnosis, because we wanted to be certain that possible recall bias did not affect the perception of complaints and we wanted to make the incidence rate as robust as possible. The possibility that respondents would mention a life time PTSD sooner during a less prospering moment in their lives, and vice versa, would conceal it while feeling in a good mood[20], might have lead to falsely diagnosing them as new onset or as recovered cases. By choosing for the twelve month recency, we took the chance of missing a PTSD of short duration in the first two years of follow up, because we believed this chance was very low, as PTSD is a persistent disorder.

The delineation of subthreshold cases

As mentioned before, a special focus of this thesis was the study of subthreshold PTSD. This approach was motivated by 1) the finding that subthreshold disorders are common in old age psychiatry, 2) the historically moving boundaries of PTSD, 3) the wish to understand the whole scope of the problem, and 4) the whish to compare results with findings in the literature.
In this chapter we will discuss how we measured subthreshold PTSD.
PTSD is the only disorder in the DSM that requires a connection between an etiologic traumatic event and subsequent symptoms. However, for the delineation of subthreshold PTSD, a screening instrument was used that registers symptoms without addressing the presence or absence of a traumatic event. The advantage of this strategy is that a possibly too narrow definition of trauma is avoided, which is a point of great concern in trauma research[10]. Relatively few studies have assessed the relevance of specific traumas in the general population and its connection with PTSD[15]. Especially in old age, people undergo events such as medical emergencies [17] or institutionalization[21], which usually do not classify as traumas but which have nevertheless severe impact. However, using a concept of PTSD that is too broad can undermine its meaning and clinical relevance.

For a prudent inclusion of subthreshold cases in our study, the optimal cut-off of the screening instrument was therefore determined with a ROC curve analysis using CIDI-confirmed PTSD cases as the gold standard. In this way, the DSM-IV diagnosis was the yardstick with which all possible subthreshold cases were measured. Using this procedure, we ascertained that a meaningful delineation would be applied. Symptomatology in subthreshold cases approaches that in DSM-IV cases and the similarities in phenomenology justify the application of this procedure. However, the subthreshold cases differed from diagnosed cases in the sense that they were more often females, had lower education, less self-efficacy, more loneliness, and more recent distressing events. Having PTSD symptoms seems to be just a part of their broader problems. One could argue that the high tendency for neuroticism in this subsample drew them to affirmative answers on several questionnaires including the SRIP and that calling them subthreshold cases is creating an undesirable medical issue and creating unnecessary costs for health care. However, the fact that these subthreshold cases suffer from negative consequences that are comparable to 'real' cases in the areas of impairment, comorbidity, negative health perception and suicidality makes that argument less important (this thesis[22-25]).

The similarities in the risk factors as well as in the factors associated with consequences of PTSD support the strong connection between cases and subthreshold cases and guarantee that some 'real caseness' is present in the subthreshold group. In addition, the clinical relevance of 'subthreshold caseness' throws a doubtful light on de rigid criteria of the DSM-IV. They seem too strict. This has already been demonstrated for young age groups[11]. Although there has been substantial criticism that the criteria of the DSM-IV are not clinically relevant enough and their use generates high prevalence rates of (full blown) psychiatric disorders, this has not been proven for PTSD[26;27]. Nor were there signs of overestimation of PTSD in the Australian National Survey of Mental Health and Well-Being considering the clinical significance criterion[28]. The authors concluded that many of the formulated criteria for PTSD in the DSM-IV contain direct references to distress and impairment (e.g. 'intrusive distressing recollections … intense psychological distress at exposure … markedly diminished interest or participation in significant activities'). Therefore, the clinical significance criterion may be redundant for diagnosing PTSD in epidemiologic surveys[26] and also in a clinical setting[27]. This may explain the great resemblance between cases and subthreshold cases for which the clinical relevance is not administered.

An investigation of the separate criteria of the DSM that may distinguish subthreshold cases from full cases would have been a desirable next step in this research if

this had been possible using the program of the computerized version of the CIDI – version 2.1. If the full diagnosis cannot be met anymore, this program skips all further questions. As a result, the full array of symptoms which are present in subthreshold cases cannot be identified. For example, it is not possible to rule out that the number of avoidance criteria -- for example one or two instead of the necessary three criteria -- made the difference between caseness and subthreshold PTSD.

Statistical issues

Determination of full DSM-IV diagnosis in the LASA cohort was optimized by a two-phase sampling model described by Dunn et al.[29]. First, all subjects were administered a screening instrument and then all subjects scoring above a threshold, as well as a random sample of screen-negative subjects, were interviewed with the diagnostic instrument. Data were weighted for sampling probability and nonresponse. The sampling weight is an indicator of how many phase-one subjects are represented by each of the phase-two records. (In our study it meant that at a cut-off of 52 points, 47 were screen-positives, from whom 41 received CIDI interviews, yielding a weight of 1.1; and that 1647 were screen-negatives, from which 381 received an interview, revealing a weight of 1647/381 = 4.4). The values are the reciprocal of the sampling fractions. The estimator of the prevalence π is given by the Horvitz-Thompson estimator $\pi=\Sigma wiyi / \Sigma wi$ in which wi is the ith subject's sampling weight and yi =1 if the ith second phase subject is a true case, or is otherwise a 0. (For our study sample this means: (6x4.4) + (7x1.1)/(381x4.4) + ((41-13)x1.1) = 0.02 = 2%).

Next, corrections for sample stratification and attrition were made in order to compute the real prevalence in Dutch citizens. (Prevalence rates were computed in age and gender matched five year-cohorts according to figures of the Central Bureau of Statistics.) The prevalence then was 0.89%.
Risk indicators were first described in bivariate analyses for the three groups: PTSD, subthreshold PTSD and controls. Subsequently, differences in the risk indicators between the full cases and the controls and subthreshold cases and the controls were computed using multivariable logistic regression analyses and these were expressed in odds ratios. In this way the importance of each risk indicator was weighted in relation to the other factors. This gave us a clear picture of which of all the burdens that can plague (older) persons with PTSD (e.g. adverse events in their youth, personality characteristics, low income, low mental or physical functioning, social isolation or recent distressing events) contributes most to the manifestation of

their PTSD. The same procedure was used in the study of effects of PTSD where the relative contribution of PTSD on dysfunction in daily life (e.g. bedridden days, days with impaired functioning, physical and social functioning and wellbeing) was computed while correcting for other factors that might have contributed to poor functioning (e.g. functional limitations, diseases, cognitive impairment, education, urbanization, marital state, and gender). Thus, the relative contribution from PTSD and subthreshold PTSD to the number of contacts with health care and the use of medication was determined and further adjusted for these other influencing factors. Finally, the influence of PTSD, relative to the other influencing factors, on satisfaction with the help received was investigated. It should be kept in mind that in this type of cross-sectional analyses, no causal links can be proven and, strictly spoken, the terms risk factor or consequences are inappropriate. It is therefore better to name them 'risk indicators' and 'associated outcome factors' respectively.

Some other statistical limitations need to be mentioned. The first limitation regards the power of the studies. Using the strict definition of PTSD, a small study group of patients with a positive diagnosis was generated in each cycle. As a consequence, possible associations may be underestimated (type II error). However, the results which we did find were important and clinically relevant.
The second limitation regards attrition. Data were gathered in the third and fourth cycle of an ongoing study with inevitable attrition of participating subjects. Throughout the study the oldest old and the most frail were more likely to drop out. In the remaining sample, the range in putative risk indicators may therefore be restricted and the chance of finding significant associations lowered. The results that are found will be an underestimation of the actual situation in the older population. Hence, findings do not entirely reflect the situation of all the older inhabitants in the Netherlands, except in the case of the prevalence rate, which was especially computed for that purpose. Results might have been more representative if the measurements had been done at the beginning of the LASA study. However, reasons for attrition were well documented and they provide directions for the interpretation of findings. It is likely that older inhabitants with PTSD in the Netherlands have even more psychiatric comorbidity and have a lower level of functioning than we found in our study.

Relevance of the studies

Relevance of our prevalence study and discussion of the results in the light of recent findings

We presented the first community based incidence and prevalence studies in older subjects After our publication on prevalence, Frans et al., published a life-time prevalence of 5.6 percent in non-elderly adults in Sweden[30] and the European Study of the Epidemiology of Mental Disorders (ESEMeD)[31] found a life-time prevalence of 1.9%. Together with the Australian finding of a twelve month prevalence of 1.33[32], these figures are considerably lower than the comparable North American prevalence studies. Differences in the time span of prevalence rates, the criteria that are used to assess PTSD, the age, and the trauma-exposure of the populations studied hamper comparisons of the prevalence rates published all over the world. However, an increase in the prevalence rate in the older population is suggested when our findings are compared to the European findings and to the findings from Davidson[14] and Perkonigg[19] who used comparable methodologies and criteria.

One reason for a higher prevalence of PTSD may be a greater trauma exposure and greater vulnerability in the aged. Greater trauma exposure can also be explained by the cumulative effects of trauma during life; previous exposure to trauma results in a greater prevalence of PTSD after subsequent trauma[15]. That these subsequent traumas may be only 'minor' events in later life, and thus do not qualify for CIDI criteria, can also be hypothesized based on the findings in Chapter 5 in which 'new' cases appeared to emerge based on older traumas. Furthermore, living longer means a longer exposure time to possible trauma and the chance of accumulation of trauma. Finally, the fact that PTSD persists longer, if not permanently, in old age (see Chapter 5) and the fact that new incidence cases may still emerge in this age group, may have contributed to the increase of the prevalence in old age.

Consequently, this increased prevalence rate should stimulate the creation of geriatric health care services that can recognize the disorder and provide proper treatment as well as care. Unfortunately, this is not common practice because older persons with PTSD seldom receive psychiatric treatment, even though their medical consumption is increased and their functioning and well-being is impaired compared to older persons without PTSD (Chapter 3).

The relevance of specific traumas identified with the CIDI list

Unique for this study is the representation of the sort of traumas that might have happened to an entire population of a country, some time during the life course, and

that caused PTSD which continued up to old age. The respondents were not influenced by the possibility of direct gain from litigation or health care facilities, nor preoccupied by the type of question nor the aim of the research; the interview was part of a very broad study and the questions were put forward in a neutral way. This is an important issue because the extant literature on PTSD in older subjects is biased towards special groups, e.g. survivors of war[33;34], male veterans[35], veterans[36], resistance veterans[4], holocaust survivors[37;38], prisoners of war[39], victims of disaster [40;41], primary care patients[24].

In nearly half of the respondents in the LASA study, a war-related trauma was mentioned as the most important contribution to PTSD. However, in more than half of the respondents, civilian traumas such as attack, rape, robbery, natural disaster and accidents were reported. Most respondents reported two or three traumas, which further diminished the role of war-related events in PTSD in these older subjects. This is in contrast with the focus of most PTSD studies in old age and thus our study demonstrates by contrast the bias towards the subject in most other studies. The other extreme of the extant literature is represented by the study of Breslau in a younger age group[15], who stated that the most reported trauma for PTSD was the death of a loved one. This trauma would certainly have been relevant to our older respondents, and could have been studied if the CIDI had not explicitly excluded that item! Even the case of an unexpected death of a loved one due to a medical emergency in a horrifying scenario of choking and bleeding, did not amount to a trauma in the CIDI classification, although it led to all the PTSD symptoms. In my opinion, that approach was too strict and we would welcome a broadening of classified traumas to include medical emergencies[10;42].

The relevance of subthreshold PTSD and its clinical implications

What makes this study special in comparison to the extant literature is the prominent role of subthreshold PTSD. The amazing finding is that the prevalence of subthreshold PTSD is out of proportion elevated and that older persons with subthreshold PTSD share most of the symptoms and the risk indicators with persons having the full diagnosis of PTSD (Chapter 2). Moreover, they suffer from many of the same consequences in daily life functioning (Chapter 3). If in addition, we realize that many of them are the same persons who once had the full diagnosis of PTSD or who will become the full diagnosis in a short time (Chapter 5), we are bound to broadening our scope of health care.

Such findings need to cause an impact on the way these people are treated in health care systems. Older persons with subthreshold PTSD need to be identified as such and their mental problems should be addressed by general practitioners and Community Mental Health Care. Communication about their needs, their appreciation of life, their fears or depressive -- or even suicidal -- thoughts, may have an ameliorative effect on their existential problems (see Chapter 3) and give clues for ameliorating their oppressive circumstances. This may prevent further isolation and days of limited activity (Chapter 3) or further progression to the full diagnosis. In case of further decline into full PTSD, treatment should focus entirely on specific evidence-based therapies for PTSD that are available, but administered far too infrequently, in my opinion (Chapter 3).

Identification of risk indicators

Salient risk indicators for PTSD and subthreshold PTSD were neuroticism and adverse events in childhood. Low self-efficacy also significantly increased the risk of subthreshold PTSD. On the one hand, it seems surprising that the effect of adverse events in childhood -- which are also well known to be pre-exposure risk factors in younger ages[43-45] -- is not always mitigated during life. On the other hand, adverse events in childhood may be the start points for many disorders[45;46], which in turn can influence trauma-exposure and hence facilitate emergence of PTSD.

We did not include separately in our putative risk factors other frequently reported risk factors such as prior mental illness or family history for mental illness[14;47], but these were incorporated in the question regarding serious illnesses of a parent in our questionnaire on adverse events in childhood. In addition, family history, prior mental illness, and neuroticism may be also interrelated. After all, neuroticism is a strong predictor of comorbidity with psychiatric disorders in general[48]. In that respect, the interesting question of cause and effect arises. Was neuroticism also caused by adverse events in childhood, or were both inheritances of mental illnesses in parents? Was the adverse event the first trauma in life with the CIDI index trauma being a subsequent trauma to an already vulnerable mind (or should one say brain?). In that respect, new psycho-biological studies may throw some light on the intertwining of risk factors and consequences; for instance substance P is substantially elevated in PTSD subjects that are triggered again by a symptom-provoking stimulus[49]. Subjects with PTSD have smaller hippocampi[50], which for a long time was regarded a consequence of PTSD. However, in one report, twin brothers with and without

PTSD both have been shown to have smaller hippocampi and now this seems more a familial vulnerability factor[51].

According to our findings, the probability of an older person having subthreshold PTSD is increased in case one or more of the following characteristics are present: having female gender, having been nervous and anxious during lifetime, assessing his/her state of health as poor, underestimating his/her capabilities, reporting having had an unhappy youth, having suffered from misfortune recently, and admitting to be lonely. Knowledge of these findings can help to direct those who manage older persons with (subthreshold) PTSD by increasing their sensitivity for the diagnosis and encouraging them to apply more appropriate treatment in the right setting (see Chapter 3).

Comorbidity and other adverse consequences of PTSD

In older persons, PTSD is very often accompanied by other anxiety disorders and depression (Chapter 4). The dangerous consequence of that comorbidity is that once anxiety disorders and/or depression are found, clinicians do not ask for other PTSD symptoms and fail to recognize the PTSD[52]. Instead they focus on depression alone or anxiety alone and improvements do not develop[13]. Our findings can be seen as advice for the management of psychiatric comorbidity: clinicians should focus on PTSD and expect that the comorbidity may disappear when the PTSD is treated (see Chapter 4).

Apart from psychiatric comorbidity, our findings indicate that somatic comorbidity is also a serious problem for older people with PTSD and that they evaluate their subjective health as poor (Chapter 2). This has also been found by others[24]. Older people with PTSD consult medical specialists more often than older persons without PTSD (Chapter 3), which does seem to be a logical consequence of increased somatic comorbidity. This has also been reported by Boscarino in veterans with PTSD[53] and by Dobie in women with PTSD in a Veteran Affairs medical centre[54]. The next question is whether this is inevitable or can be prevented to some extent by therapy for PTSD. The scarce literature on the possible preventive role of therapy in a younger population draws an ambivalent picture: therapy does not change the course of the disease, but clearly improves several areas of functioning and satisfaction about life[55]. This is exactly what the older population in our study lacks; they do not receive proper therapies and have more days of limited functioning and are less satisfied about their life. Future programs for PTSD should initiate improvements in health care service that will tackle this lack of care for the older subjects with PTSD.

Usefulness of a validated SRIP for the older population

Knowledge of the properties of the SRIP as a screening instrument that is validated in the general older population, may help to apply health care in a more efficient way. For example, in case of a disaster or a terrorist attack it might be applied to a large population for a first quick identification of possible victims that are in danger of developing PTSD. The estimation of the number of persons with diagnosable PTSD and need of health care can then be calculated by the number of SRIP positive identified persons. Furthermore, the validated SRIP can facilitate further epidemiologic research in this age group.

Recommendations for future research

As mentioned above, it would be interesting to replicate the investigations of the prevalence rate in an earlier stage of a new cohort study when attrition is at a minimal level. On the one hand, it should become clear if our corrections for attrition were justified. On the other hand, cohort effects may distort comparisons. Cohort effects may be due to influence of war-related traumas, impact of the great (pre-war) depression and war-related starvation, all of which may have influenced peri-conceptual, prenatal and early postnatal circumstances and led to susceptibility to several mental and somatic diseases.

Only a few connections to health issues were made in this thesis, but further research into the somatic morbidity and mortality of PTSD in this age group is very much needed and may have important consequences regarding prevention and health management. In that respect, newly discovered neurobiological factors (substance P) influencing PTSD[49] may be measured in connection with cortisol levels in order to further unravel the body-mind connection in older subjects with PTSD. With respect to questions that are more epidemiologic, the connection of PTSD with substance abuse is a topic for further research.
An important issue for primary care is the reliability of the assessment of PTSD in older persons by the general practitioner which is still unclear now. Finally, in new research a broad inclusion of possible traumatic events is warranted, including medical emergences and the shock of sudden death of a beloved one. The concept of subthreshold PTSD is fruitful and should be included again in future research. This necessitates a precise administration of all symptoms in the CIDI in each respondent above the screener threshold.

Final Remarks

This study was the first unique chance to gain insight into what PTSD means in a community-based older population from which an enormous amount of information has been gathered. Due to the opportunity to look for associations (e.g. recent life events) while controlling for other factors (e.g. neuroticism), complex interactions could be unraveled, which was unique. Also, more basic but still unresolved epidemiologic questions were illuminated. We found that several traumatic events led to the disorder, which is not rare with a prevalence rate of 0.9% in the older persons in the Netherlands. With still new cases emerging with an incidence rate of 10% for subthreshold PTSD and 0.4% for full PTSD in three years and with the high persistence that we found, PTSD deserves the attention of those who provide health care for older people. Even for subthreshold disorder, which is often short-lived because the disorder fluctuates, consequences for activities, health care and quality of life appeared to be severe. Neuroticism and adverse events in early life each multiply the risk of PTSD more than tenfold. Severity of PTSD increases psychiatric comorbidity of PTSD, and is expected to subside with appropriate treatment of PTSD. However, we found that appropriate treatment is almost a utopia in everyday practice, which leads to unmet needs and dissatisfaction. There is ample room for improvement in the care for older PTSD sufferers.

References

1. Flint AJ. Epidemiology and comorbidity of anxiety disorders in the elderly. Am J Psychiatry 1994; 151(5):640-649.
2. Averill PM, Beck JG. Posttraumatic stress disorder in older adults: a conceptual review. J Anxiety Disord 2000; 14(2):133-156.
3. Bramsen I, van der Ploeg HM. Fifty years later: the long-term psychological adjustment of ageing World War II survivors. Acta Psychiatr Scand 1999; 100(5):350-358.
4. Aarts PGH, op den Velde W, Falgar PRJ, Hovens JE, de Groen JHM. Late onset of posttraumatic stress disorder in aging resistance veterance in the Netherlands. In: Ruskin PE, Talbot JA, editors. Aging and Posttraumatic Stress Disorder. Washington, DC: American Psychiatric Press, 1996: 53-76.
5. Beekman AT, Deeg DJ, van Tilburg T, Smit JH, Hooijer C, van Tilburg W. Major and minor depression in later life: a study of prevalence and risk factors. J Affect Disord 1995; 36(1-2):65-75.
6. de Beurs E, Beekman AT, van Balkom AJ, Deeg DJ, van Dyck R, van Tilburg W. Consequences of anxiety in older persons: its effect on disability, well-being and use of health services. Psychol Med 1999; 29(3):583-593.
7. APA. Diagnostic and Statistical Manual of Mental Disorders 3 ed. Washington, D.C: American Psychiatric Press Inc., 1980.
8. APA. Diagnostic and Statistical Manual of Mental Disorders 3 revised ed. Washington, D.C.: American Psychiatric Press Inc., 1987.
9. APA. Diagnostic and Statistical Manual of Mental Disorders 4th ed. Washington D.C.: 1994.
10. Resnick HS, Falsetti SA, Kilpatrick DG. Assessment of Rape and Other Civilian Trauma-Related Post-traumatic Stress Disorder: Emphasis on Assessment of Potentially Traumatic Events. In: Miller TW, editor. Theory and assessment of stressful life events. Madison CT: International Universities Press, Inc, 1996: 235-271.
11. Scheeringa MS, Wright MJ, Hunt JP, Zeanah CH. Factors Affecting the Diagnosis and Prediction of PTSD Symptomatology in Children and Adolescents. Am J Psychiatry 2006; 163(4):644-651.
12. Miller TW. Theory and assessment of stressful life events.International Universities Press stress and health series. Goldberger L, editor. [Monograph 6]. 1996. Madison, CT, International Universities Press, Inc. International Universities Press Stress and Health Series. Goldberger, L. 1996.
13. Hegel MT, Unutzer J, Tang L, Arean PA, Katon W, Noel PH et al. Impact of comorbid panic and posttraumatic stress disorder on outcomes of collaborative care for late-life depression in primary care. Am J Geriatr Psychiatry 2005; 13(1):48-58.
14. Davidson JR, Hughes D, Blazer DG, George LK. Post-traumatic stress disorder in the community: an epidemiological study. Psychol Med 1991; 21(3):713-721.

15. Breslau N, Chilcoat HD, Kessler RC, Davis GC. Previous exposure to trauma and PTSD effects of subsequent trauma: results from the Detroit Area Survey of Trauma. Am J Psychiatry 1999; 156(6):902-907.
16. Amaya-Jackson L, Davidson JR, Hughes DC, Swartz M, Reynolds V, George LK et al. Functional impairment and utilization of services associated with posttraumatic stress in the community. J Trauma Stress 1999; 12(4):709-724.
17. Stein MB, McQuaid JR, Pedrelli P, Lenox R, McCahill ME. Posttraumatic stress disorder in the primary care medical setting. Gen Hosp Psychiatry 2000; 22(4):261-269.
18. Perkonigg A, Pfister H, Stein MB, Hofler M, Lieb R, Maercker A et al. Longitudinal course of posttraumatic stress disorder and posttraumatic stress disorder symptoms in a community sample of adolescents and young adults. Am J Psychiatry 2005; 162(7):1320-1327.
19. Perkonigg A, Kessler RC, Storz S, Wittchen HU. Traumatic events and post-traumatic stress disorder in the community: prevalence, risk factors and comorbidity. Acta Psychiatr Scand 2000; 101(1):46-59.
20. McNally RJ. Remembering trauma. The Belknap Press of Harvard University Press, Cambridge, M.A., 2003.
21. Ruskin PE, Talbot JA. Aging and Posttraumatic Stress Disorder. 1 ed. Washington, DC: American Psychiatric Press, 1996.
22. Marshall RD, Olfson M, Hellman F, Blanco C, Guardino M, Struening EL. Comorbidity, impairment, and suicidality in subthreshold PTSD. Am J Psychiatry 2001; 158(9):1467-1473.
23. Stein MB, Walker JR, Hazen AL, Forde DR. Full and partial posttraumatic stress disorder: findings from a community survey. Am J Psychiatry 1997; 154(8):1114-1119.
24. Rauch SA, Morales KH, Zubritsky C, Knott K, Oslin D. Posttraumatic stress, depression, and health among older adults in primary care. Am J Geriatr Psychiatry 2006; 14(4):316-324.
25. Johnson DM, Zlotnick C, Zimmerman M. The clinical relevance of a partial remission specifier for posttraumatic stress disorder. J Trauma Stress 2003; 16(5):515-518.
26. Spitzer RL, Wakefield JC. DSM-IV diagnostic criterion for clinical significance: does it help solve the false positives problem? Am J Psychiatry 1999; 156(12):1856-1864.
27. Zimmerman M, Chelminski I, Young D. On the threshold of disorder: a study of the impact of the DSM-IV clinical significance criterion on diagnosing depressive and anxiety disorders in clinical practice. J Clin Psychiatry 2004; 65(10):1400-1405.
28. Narrow WE, Rae DS, Robins LN, Regier DA. Revised prevalence estimates of mental disorders in the United States: using a clinical significance criterion to reconcile 2 surveys' estimates. Arch Gen Psychiatry 2002; 59(2):115-123.
29. Dunn G, Pickles A, Tansella M, Vazquez-Barquero JL. Two-phase epidemiological surveys in psychiatric research. Br J Psychiatry 1999; 174:95-100.
30. Frans O, Rimmo PA, Aberg L, Fredrikson M. Trauma exposure and post-traumatic stress disorder in the general population. Acta Psychiatr Scand 2005; 111(4):291-299.

31. Alonso J, Angermeyer MC, Bernert S, Bruffaerts R, Brugha TS, Bryson H et al. Disability and quality of life impact of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. Acta Psychiatr Scand Suppl 2004;(420):38-46.
32. Creamer M, Burgess P, McFarlane AC. Post-traumatic stress disorder: findings from the Australian National Survey of Mental Health and Well-being. Psychol Med 2001; 31(7):1237-1247.
33. Bramsen I. The long-term psychological adjustment of world war II survivors in the Netherlands. Delft: Eburon, 1995.
34. Kaup BA, Ruskin PE, Nyman G. Significant Life Events and PTSD in elderly World War II Veterans. Am J Geriatr Psychiatry 1994; 2:239-243.
35. Schnurr PP, Lunney CA, Sengupta A, Spiro A, III. A longitudinal study of retirement in older male veterans. J Consult Clin Psychol 2005; 73(3):561-566.
36. Cook JM, Elhai JD, Cassidy EL, Ruzek JI, Ram GD, Sheikh JI. Assessment of trauma exposure and post-traumatic stress in long-term care veterans: preliminary data on psychometrics and post-traumatic stress disorder prevalence. Mil Med 2005; 170(10):862-866.
37. Brodaty H, Joffe C, Luscombe G, Thompson C. Vulnerability to post-traumatic stress disorder and psychological morbidity in aged holocaust survivors. Int J Geriatr Psychiatry 2004; 19(10):968-979.
38. Brom D, Durst N, Aghassy G. The Phenomenology of Posttraumatic Distress in Older Adult Holocaust Survivors. Journal of Clinical Geropsychology 2002; 8(3):189-201.
39. Port CL, Engdahl B, Frazier P. A longitudinal and retrospective study of PTSD among older prisoners of war. Am J Psychiatry 2001; 158(9):1474-1479.
40. Knight BG, Gatz M, Heller K, Bengtson VL. Age and emotional response to the Northridge earthquake: a longitudinal analysis. Psychol Aging 2000; 15(4):627-634.
41. Kohn R, Levav I, Garcia ID, Machuca ME, Tamashiro R. Prevalence, risk factors and aging vulnerability for psychopathology following a natural disaster in a developing country. Int J Geriatr Psychiatry 2005; 20(9):835-841.
42. Stein MB, Hofler M, Perkonigg A, Lieb R, Pfister H, Maercker A et al. Patterns of incidence and psychiatric risk factors for traumatic events. Int J Methods Psychiatr Res 2002; 11(4):143-153.
43. Breslau N, Kessler RC, Chilcoat HD, Schultz LR, Davis GC, Andreski P. Trauma and posttraumatic stress disorder in the community: the 1996 Detroit Area Survey of Trauma. Arch Gen Psychiatry 1998; 55(7):626-632.
44. Bromet E, Sonnega A, Kessler RC. Risk factors for DSM-III-R posttraumatic stress disorder: findings from the National Comorbidity Survey. Am J Epidemiol 1998; 147(4):353-361.

45. Goldberg JF, Garno JL. Development of posttraumatic stress disorder in adult bipolar patients with histories of severe childhood abuse. J Psychiatr Res 2005; 39(6):595-601.
46. Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. Am J Prev Med 1998; 14(4):245-258.
47. Reich J, Lyons M, Cai B. Familial vulnerability factors to post-traumatic stress disorder in male military veterans. Acta Psychiatr Scand 1996; 93(2):105-112.
48. Khan AA, Jacobson KC, Gardner CO, Prescott CA, Kendler KS. Personality and comorbidity of common psychiatric disorders. Br J Psychiatry 2005; 186:190-196.
49. Geracioti TD, Jr., Carpenter LL, Owens MJ, Baker DG, Ekhator NN, Horn PS et al. Elevated cerebrospinal fluid substance p concentrations in posttraumatic stress disorder and major depression. Am J Psychiatry 2006; 163(4):637-643.
50. Gilbertson MW, Shenton ME, Ciszewski A, Kasai K, Lasko NB, Orr SP et al. Smaller hippocampal volume predicts pathologic vulnerability to psychological trauma. Nat Neurosci 2002; 5(11):1242-1247.
51. Gurvits TV, Metzger LJ, Lasko NB, Cannistraro PA, Tarhan AS, Gilbertson MW et al. Subtle neurologic compromise as a vulnerability factor for combat-related posttraumatic stress disorder: results of a twin study. Arch Gen Psychiatry 2006; 63(5):571-576.
52. Brady KT, Killeen TK, Brewerton T, Lucerini S. Comorbidity of psychiatric disorders and posttraumatic stress disorder. J Clin Psychiatry 2000; 61 Suppl 7:22-32.
53. Boscarino JA. Posttraumatic stress disorder and physical illness: results from clinical and epidemiologic studies. Ann N Y Acad Sci 2004; 1032:141-153.
54. Dobie DJ, Maynard C, Kivlahan DR, Johnson KM, Simpson T, David AC et al. Posttraumatic stress disorder screening status is associated with increased VA medical and surgical utilization in women. J Gen Intern Med 2006; 21 Suppl 3:S58-64.:S58-S64.
55. Johnson DR, Fontana A, Lubin H, Corn B, Rosenheck R. Long-term course of treatment-seeking Vietnam veterans with posttraumatic stress disorder: mortality, clinical condition, and life satisfaction. J Nerv Ment Dis 2004; 192(1):35-41.